

حمل الآن

مجاناً وحصرياً

المراجعة رقم (1)

الترم الاول



Choose the correct answer:

1)	$\vec{F}_1 = 2\hat{i} + 3\hat{j}$, $\vec{F}_2 = \hat{i} + \hat{j}$ where F_1 , F_2 are measured in newton then the magnitude of their resultant newton. (a) $\sqrt{2}$ (b) $\sqrt{5}$ (c) $\sqrt{13}$ (d) 5
2)	Two forces of magnitude 3 , 5 newton , then their resultant $\in$ (a) $[3 , 5]$ (b) $]3 , 5[$ (c) $[2 , 8]$ (d) $]2 , 8[$
3)	The resultant of two forces acting at a point is maximum when the included angle between them is equal to (a) zero (b) 60° (c) 120° (d) 180°
4)	The magnitude of the resultant of two forces 3 , 5 newton and the measure of their included angle is 60° equals newton. (a) 2 (b) 6 (c) 7 (d) 8
5)	Two forces of magnitude 3 F and 2 F intersecting at a point and their resultant is 5 F , then the measure of the angle between them is (a) 0° (b) 60° (c) 20° (d) 180°
6)	As resolving the force $\vec{R}$ into two forces $\vec{F}_1$ and $\vec{F}_2$ making with $\vec{R}$ two angles of measure θ_1 and θ_2 on both sides of $\vec{R}$ respectively , then the magnitude of $\vec{F}_1 =$ (a) $\frac{R \sin \theta_1}{\sin (\theta_1 + \theta_2)}$ (b) $\frac{R \sin \theta_2}{\sin (\theta_1 - \theta_2)}$ (c) $\frac{R \sin \theta_2}{\sin (\theta_1 + \theta_2)}$ (d) $\frac{R \sin (\theta_1 + \theta_2)}{\sin \theta_2}$
6)	Two forces of equal magnitudes , inclosing between them an angle of measure 90° If the magnitude of their resultant is 8 N , then the value of each force measured in newton is (a) $2\sqrt{2}$ (b) 4 (c) $4\sqrt{2}$ (d) 8

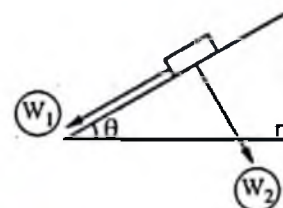
7)	In the given figure : $F_1 = \dots\dots\dots$ (a) $12 \cos 75^\circ$ (b) $12 \cos 45^\circ$ (c) $6 \sec 45^\circ$ (d) $6 \csc 75^\circ$	
8)	Two forces of equal magnitude and intersecting at a point. The measure of the angle between the two forces is 120° and the magnitude of each is 6 N. , then the magnitude of their resultant = $\dots\dots\dots$ N. (a) 12 (b) $6\sqrt{3}$ (c) 6 (d) $12\sqrt{3}$	
9)	F N. and K N. are the magnitudes of two forces where $F > K$ If the smallest and the greatest value of their resultant are 5 , 9 newton respectively , then $5F - 2K = \dots\dots\dots$ N. (a) 53 (b) 31 (c) 49 (d) 4	
10)	Two forces of magnitudes 3 , F newton and measure of the angle between them is $\frac{2\pi}{3}$ if their resultant is perpendicular to the first force , then F = $\dots\dots\dots$ newton. (a) 1.5 (b) 3 (c) $3\sqrt{2}$ (d) 6	
11)	The resultant of two forces 6 , 8 newton is 10 N. , then the measure of the angle between their directions = $\dots\dots\dots^\circ$ (a) 60 (b) 90 (c) 120 (d) 150	
12)	The magnitudes of two forces are 5 and 10 newton and their resultant is perpendicular on the smaller force. If the measure of angle between the two forces is α and their resultant is R , then $\dots\dots\dots$ (a) $\alpha = 60^\circ$, $R = 10\sqrt{3}$ N. (b) $\alpha = 120^\circ$, $R = 10\sqrt{3}$ N. (c) $\alpha = 60^\circ$, $R = 5\sqrt{3}$ N. (d) $\alpha = 120^\circ$, $R = 5\sqrt{3}$ N.	
13)	A body of weight (W) is placed on an inclined plane makes angle of measure θ to the horizontal then the component of its weight in direction of line of greatest slope equals $\dots\dots\dots$ (a) $W \cos \theta$ (b) $W \sin \theta$ (c) $W \tan \theta$ (d) W	

14)	Given : $\vec{F}_1 = 3\hat{i} - 2\hat{j}$, $\vec{F}_2 = a\hat{i} - \hat{j}$, $\vec{F}_3 = 4\hat{i} - b\hat{j}$ and their resultant $\vec{R} = 6\hat{i} - 4\hat{j}$, then $a + b = \dots\dots\dots$ (a) 2 (b) - 2 (c) zero (d) - 1
15)	Given : $\vec{F}_1 = 5\hat{i}$, $\vec{F}_2 = 7\hat{i} - 5\hat{j}$, $\vec{R}$ is their resultant then $\ \vec{R}\ = \dots\dots\dots$ (a) $\sqrt{5} + \sqrt{74}$ (b) 49 (c) 13 (d) $\sqrt{12} - \sqrt{5}$
16)	The maximum and minimum value respectively of the resultant of the two forces of magnitudes 8 , 13 newton are $\dots\dots\dots$ newton. (a) 13 , 8 (b) 13 , 5 (c) 21 , 8 (d) 21 , 5
17)	Two forces of equal magnitudes , the magnitude of their resultant is 3 newton and the measure of the angle between them is $\frac{\pi}{3}$, then the magnitude of each $\dots\dots\dots$ newton. (a) $\sqrt{3}$ (b) 3 (c) $\frac{3}{2}$ (d) $3\sqrt{3}$
18)	Three equal forces in magnitudes act at a point and the forces are in equilibrium , then the measure of the angle between any two forces = $\dots\dots\dots$ (a) 60° (b) 90° (c) 120° (d) 150°
19)	A body of weight 20 N. is placed on a smooth inclined plane makes an angle of measure 30° with the horizontal , then the component of the weight in direction perpendicular to the plane = $\dots\dots\dots$ N. (a) 10 (b) 20 (c) $10\sqrt{2}$ (d) $10\sqrt{3}$
20)	Forces of magnitudes 8 , $4\sqrt{3}$, $6\sqrt{3}$, 14 newton act at a point. The measure of the angle between the first and second force is 30° and between the second and third is 120° and between the third and fourth is 90° in one cyclic order , then the magnitude of their resultant = $\dots\dots\dots$ (a) 4 (b) 6 (c) 8 (d) 7

21)

In the opposite figure :

A body of weight 260 gm.wt. and $\tan \theta = \frac{5}{12}$, W_1 , W_2 are magnitudes of the two components in direction of the inclined plane downward and perpendicular to the plane , then

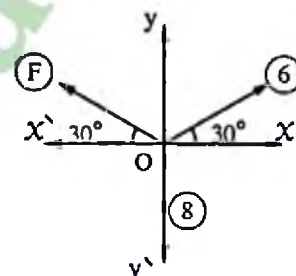


- (a) $W_1 = 120$ gm.wt. , $W_2 = 50$ gm.wt. (b) $W_1 = 260$ gm.wt. , $W_2 = 65$ gm.wt.
(c) $W_1 - W_2 = 70$ gm.wt. (d) $W_1 + W_2 = 340$ gm.wt.

22)

In the opposite figure :

If the resultant of the shown forces acts in direction of y-axis , then $F = \dots\dots\dots$ N.



- (a) 2 (b) 6
(c) 8 (d) 14

22)

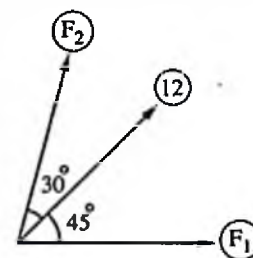
Two forces act at a point. The magnitude of the two forces are 6 , 3 newton and their resultant is perpendicular to one of them , then the magnitude of their resultant = newton.

- (a) 3 (b) $3\sqrt{3}$ (c) 6 (d) $6\sqrt{3}$

23)

In the opposite figure :

If the force of magnitude 12 N. is resolved into two components $\vec{F}_1$ and $\vec{F}_2$, then $F_1 = \dots\dots\dots$ newton.



- (a) $12 \cos 75^\circ$ (b) $12 \cos 45^\circ$
(c) $6 \csc 45^\circ$ (d) $6 \csc 75^\circ$

24)

If $\vec{F}_1 = \hat{i} - \hat{j}$, $\vec{F}_2 = 2\hat{i} - 4\hat{j}$ and their resultant $\vec{R} = 2a\hat{i} - 3b\hat{j}$, then $a + b = \dots\dots\dots$

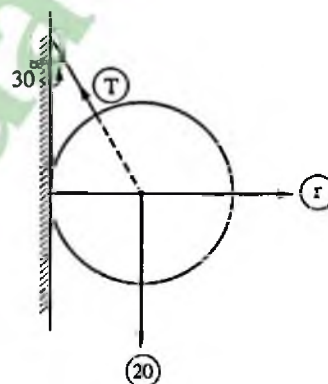
- (a) 3 (b) $3\frac{1}{3}$ (c) $3\frac{1}{6}$ (d) 12

25)

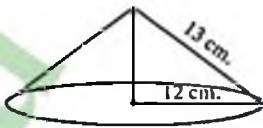
If the two straight lines L_1 and L_2 are skew , then $L_1 \cap L_2 = \dots\dots\dots$

- (a) $\emptyset$ (b) L_1
(c) L_2 (d) the plane contains L_1 and L_2

26)	Three equal forces in magnitude meeting at a point and they are in equilibrium , then the measure of the angle between each two forces =	(a) 60°	(b) 90°	(c) 120°	(d) 150°
27)	Number of planes that are passing through two different parallel straight lines =	(a) 1	(b) 2	(c) 3	(d) an infinite number.
28)	In the opposite figure : A smooth sphere of weight 20 newton rests against a smooth vertical wall. It is suspended at a point on its surface by means of a string and the other end is fixed to the wall at a point lies directly above the point of tangency of the sphere and the wall , if the string makes with the vertical an angle of measure 30° , then in case of equilibrium $T : r = \dots\dots\dots$	(a) 2 : 1	(b) 1 : 2	(c) $\sqrt{3} : 1$	(d) $2 : \sqrt{3}$
29)	A regular quadrilateral pyramid , the area of its base = 100 cm ² and its height is 12 cm. , then its lateral area equal cm ² .	(a) 260	(b) 520	(c) 130	(d) 360
30)	Two forces of magnitudes 6 N. and 8 N. , if the magnitude of their resultant is 2 N , then the measure of the angle between the two forces is	(a) 30°	(b) 90°	(c) 180°	(d) 270°
31)	The centre of the circle in which its diameter is $\overline{AB}$ where $A = (-1, 3)$, $B = (5, -3)$ is	(a) (4 , 0)	(b) (2 , 0)	(c) (-6 , -6)	(d) (0 , 4)
32)	The centre of the circle whose equation $2x^2 + 2y^2 + 12x - 16y = 0$ is	(a) (3 , -4)	(b) (-6 , 8)	(c) (-3 , 4)	(d) (6 , -8)



33)	A regular quadrilateral pyramid whose lateral area = 30 cm^2 , and its slant height = 5 cm. , then its base perimeter = cm. (a) 6 (b) 12 (c) 24 (d) 36
34)	In a right circular cone , the radius length of its base = 15 cm. and its height = 20 cm. , then its lateral area = cm^2 (a) 375π (b) 600π (c) 1500π (d) 1875π
35)	The diameter length of the circle : $4x^2 + 4y^2 + 16x - 8y - 16 = 0$ equals length unit. (a) 3 (b) 6 (c) 12 (d) 24
36)	A right quadrilateral pyramid its total surface area = 70 cm^2 and its lateral surface area = 45 cm^2 , then its height = cm. (a) 2.5 (b) 5 (c) 4.5 (d) $\sqrt{14}$
37)	If the X-axis touches the circle : $x^2 + y^2 + mx + 4y + 7 - 3m = 0$, then m = (a) 2 or 14 (b) -2 or -14 (c) 2 or -14 (d) -2 or 14
38)	The number of planes that pass through three colinear points is (a) 1 (b) 2 (c) 3 (d) infinite number.
39)	If $\overleftrightarrow{XY} \subset \text{plane M}$, $\overleftrightarrow{LZ} \parallel \text{plane M}$, then $\overleftrightarrow{XY}$ and $\overleftrightarrow{LZ}$ are (a) only parallel. (b) only skew. (c) parallel or skew. (d) intersecting.
40)	A right circular cone if its base radius length is decreased to be half of its length and its height is increased to be double its length , then its volume will be (a) as it is (b) four times (c) its half (d) doubled

41)	The radius length of the circle of equation : $(n + 3) x^2 + y^2 + (m - n) x - 4 y + (m - 2) x y - 8 = 0$ is unit length. (a) 2 (b) 4 (c) 6 (d) 8	
42)	The central angle of the sector if folded It becomes the opposite cone is (a) acute (b) right (c) obtuse (d) reflex	
43)	The straight line $3x - 4y - 12 = 0$ touches the circle $(x + 3)^2 + (y - 1)^2 = r^2$, then the circumference of the circle = (a) 5π (b) 10π (c) 15π (d) 20π	
44)	A triangular regular faces pyramid whose edge length is 6 cm. , then its height = cm. (a) $6\sqrt{2}$ (b) $3\sqrt{2}$ (c) $2\sqrt{6}$ (d) 6	
45)	A body of weight (w) kg.wt. is placed on a rough horizontal plane and the coefficient of static friction between the body and the plane = $\frac{2}{5}$ If a horizontal force of magnitude 45 kg.wt. acts on the body and make it about to move , then the weight of the body = kg.wt. (a) 22.5 (b) 90 (c) 112.5 (d) 225	
46)	Tangent of the angle between the normal reaction and the resultant reaction at the limiting friction is called (a) angle of friction. (b) coefficient of friction. (c) the friction force. (d) the limiting friction force.	

47)

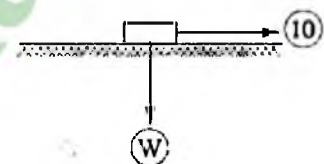
The coefficient of static friction is

- (a) a force acts against the force acting on the body.
- (b) the resultant of the normal reaction and friction.
- (c) the ratio between the magnitude of the limiting friction to the magnitude of the normal reaction.
- (d) the ratio between the magnitude of the resultant reaction to the magnitude of the limiting friction.

48)

In the opposite figure :

A body of weight (w) kg.wt. is placed on a rough horizontal surface. A horizontal force of magnitude 10 kg.wt. acts on the body and makes the body about to move. The resultant reaction of the surface is $10\sqrt{2}$ kg.wt. , then the weight of the body (w) = kg.wt.

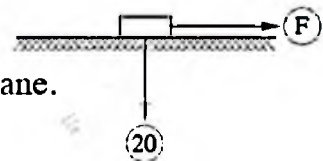


- (a) 10
- (b) 20
- (c) $10\sqrt{2}$
- (d) $20\sqrt{2}$

49)

In the opposite figure :

A body of weight 20 kg.wt. is placed on a rough horizontal plane. A horizontal force acts on the body to make it about to move when the resultant reaction = 25 kg.wt. , then the coefficient of static friction between the body and the plane =



- (a) $\frac{4}{5}$
- (b) $\frac{4}{3}$
- (c) $\frac{3}{5}$
- (d) $\frac{3}{4}$

50)

A body of weight 6 N. was placed on a rough inclined plane so it was about to slide if the limiting friction was $3\sqrt{3}$ N. , then the measure of the inclination angle of the plane to the horizontal equals°

- (a) 30
- (b) 45
- (c) 60
- (d) 90

51)

In the opposite figure :

The body is about to slide downwards

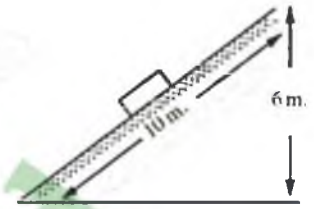
, then the coefficient of static friction =

(a) $\frac{3}{5}$

(b) $\frac{4}{5}$

(c) $\frac{3}{4}$

(d) $\frac{4}{3}$



52)

A body is placed on an inclined rough plane makes an angle of measure 60° and

the coefficient of static friction between the body and the plane is $\frac{\sqrt{3}}{6}$, then the body

(a) is about to move up the plane.

(b) is about to move down the plane.

(c) moves on the plane.

(d) remains at rest but not about to move.

53)

In the opposite figure :

A body of mass 5 kg. is placed on a rough inclined plane , connected with light string passes over a smooth.

pulley at the edge of the plane and the other end of the string tied to a body of mass 6 kg. If the system

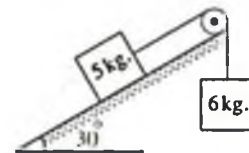
is in equilibrium , then the magnitude and the direction of the friction force is

(a) 3.5 kg.wt. upward.

(b) 3.5 kg.wt. downward.

(c) 8.5 kg.wt. upward.

(d) 8.5 kg.wt. downward.



54)

In the opposite figure :

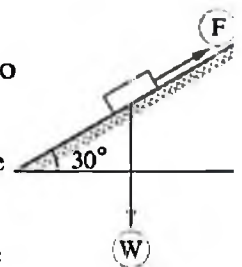
A body of weight (W) newton is placed on a rough plane inclined to the horizontal by an angle of measure 30° , a force of magnitude F newton in the direction of the line of the greatest slope upwards the plane acts on it to make the body about to move upwards when the magnitude of the resultant reaction between the body and the plane equals (W) newton , then F = newton.

(a) W

(b) $\frac{\sqrt{3}}{2} W$

(c) $\frac{1}{2} W$

(d) $\sqrt{3} W$

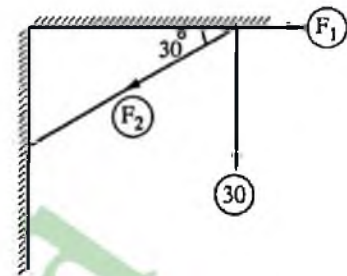


55)

In the opposite figure :

A force of magnitude 30 newton is resolved into two components , one of them is horizontal of magnitude F_1 and the other is of magnitude F_2 , then $F_1 = \dots\dots\dots$ newton.

- (a) 30 (b) 60
(c) $60\sqrt{3}$ (d) $30\sqrt{3}$

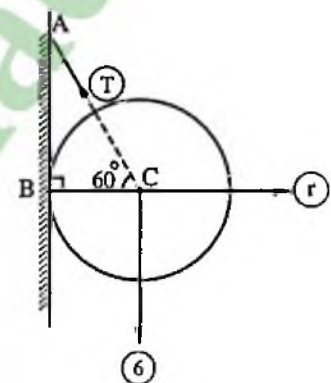


56)

In the opposite figure :

If the sphere is in equilibrium , then $T - r = \dots\dots\dots$ newton.

- (a) $6\sqrt{3}$
(b) $4\sqrt{3}$
(c) $2\sqrt{3}$
(d) 2



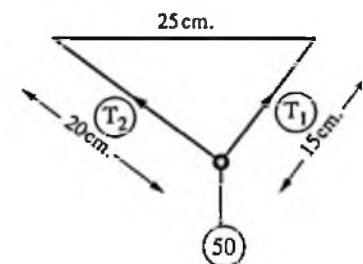
57)

In the opposite figure :

A body of weight 50 gm.wt. Is suspended by two strings of lengths 15 cm. and 20 cm. and the other two ends of the string are fixed on two points of a horizontal line the distance between them is 25 cm.

, then $T_1 + T_2 = \dots\dots\dots$ gm.wt.

- (a) 30 (b) 40 (c) 70 (d) 10



58)

ABCD is a rectangle in which $AB = 4$ cm. , $BC = 3$ cm. , forces of magnitude 2 , 5 , 3 act in the directions of $\overrightarrow{AB}$, $\overrightarrow{AC}$, $\overrightarrow{AD}$ respectively , then the resultant of these forces = $\dots\dots\dots$

- (a) $4\sqrt{2}$ (b) $6\sqrt{2}$ (c) $8\sqrt{2}$ (d) $10\sqrt{2}$

59)

A body of weight (W) newton is placed on a plane inclined to the horizontal at an angle of measure (θ) if the components of the weight in the direction of the line of the greatest slope and the perpendicular to it are 7 and 24 newton respectively , then the magnitude of the weight (W) =

- (a) 7 (b) 24 (c) 25 (d) 31

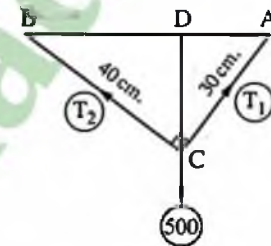
60)

In the opposite figure :

If the system are in equilibrium.

, then $T_1 + T_2 = \dots\dots\dots$

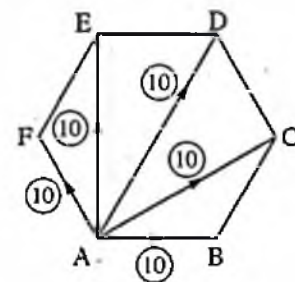
- (a) 100 (b) 300
(c) 400 (d) 700



61)

Five forces equal in magnitude each equals 10 newton act on one of vertices of a regular hexagon in directions of the other vertices as shown in the opposite figure , then the resultant of this forces is newton.

- (a) 50 (b) 20
(c) $30\sqrt{3}$ (d) $20 + 10\sqrt{3}$

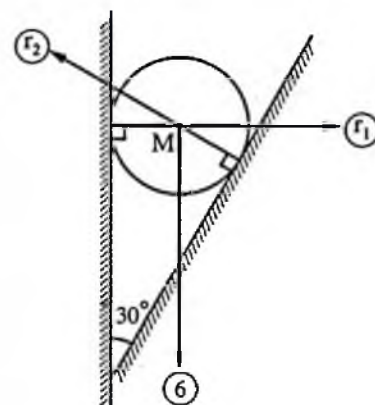


62)

The given figure represents a sphere is placed between a smooth vertical wall and another one inclined to a vertical wall at an angle of measure 30°

, then $\sqrt{3} r_1 + r_2 = \dots\dots\dots$

- (a) $18\sqrt{3}$ (b) $12\sqrt{3}$
(c) 30 (d) 24



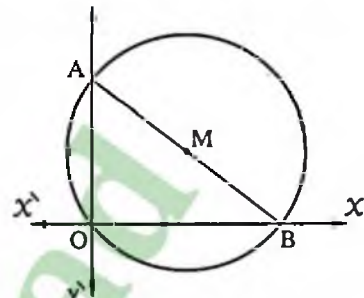
Essay

1)

In the opposite figure :

$OA = 6$ unit length , $OB = 8$ unit length

Find the equation of the circle passes through ΔAOB

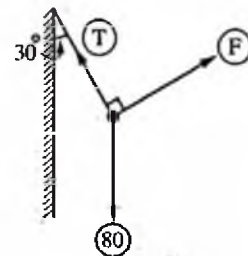


2)

A body of weight 80 gm.wt. is suspended at one end of a string, the other end of the string is fixed at a point on a vertical wall with an angle of measure 30° .

A force of magnitude F acts perpendicular to the string to become in equilibrium.

Find the magnitude of the force and the tension in the string.



3)

If the length of the height of a regular triangular pyramid is 24 cm. and the length of its base height is 30 cm. find

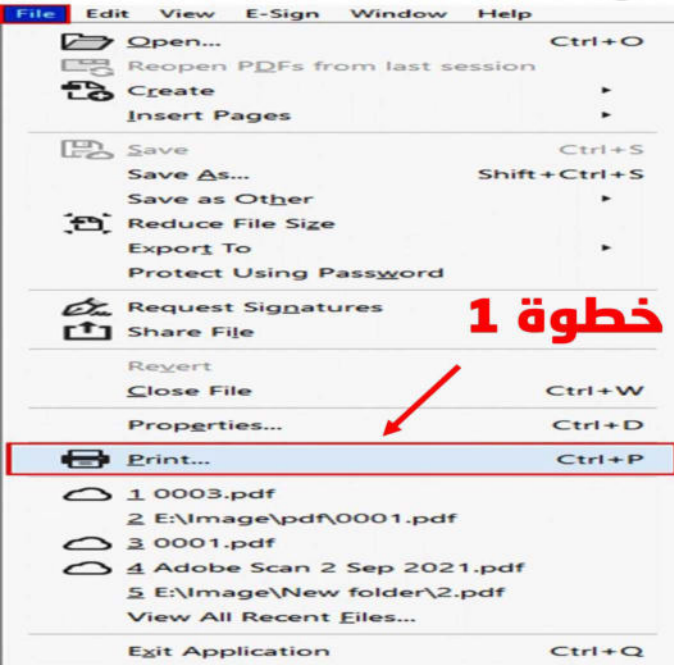
(a) The lateral area of the pyramid.

(b) The volume of the pyramid.

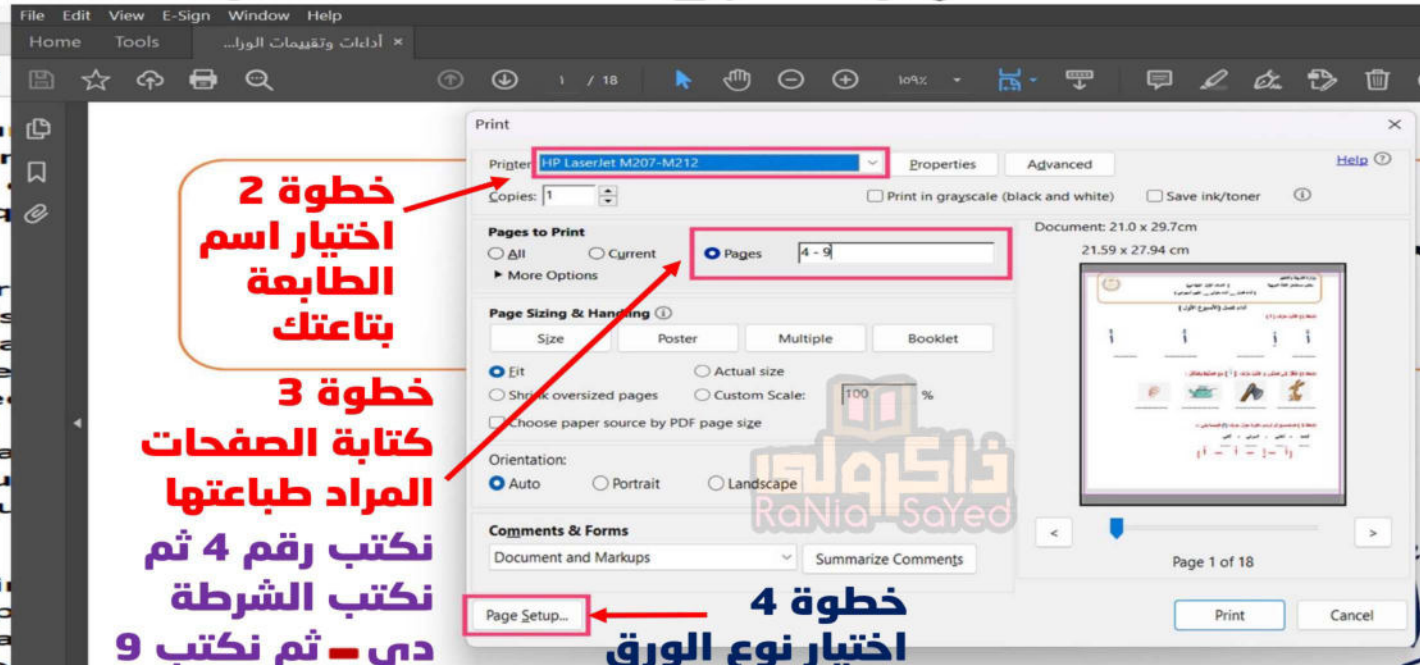
4)	AB is a uniform rod , its end A is attached by a hinge fixed in vertical wall A horizontal force acts at the end B to keep rod in equilibrium while it inclined to the wall by an angle of measure 45° , if the weight of the rod is 4 kg.wt acts at its midpoint , then find the magnitude of the force and the reaction of the hinge.	
5)	A regular quadrilateral pyramid. the side length of its base is 18 cm. and its volume is 1296 cm^3 , find its slant height and its lateral surface area.	
6)	A smooth sphere of radius length 30 cm. and of weight 200 gm.wt. rests on a vertical smooth wall. It is suspended by a string of length 20 cm. , one of its ends is attached to a point on the surface of the sphere and the other end is fixed at a point on the wall above the touch point of the sphere and the wall. Find the magnitudes of the tension in the string and the reaction of the wall in case of equilibrium.	

7)	A regular quadrilateral pyramid whose base area is 700 cm^2 and its slant height is 20 cm. Find its volume.	
8)	A uniform rod of length 65 cm. and weight 26 newton is suspended at its ends by two strings tied at a point. If the length of one of them is 35 cm. and the length of the other is 60 cm. What is the tension in each of the two strings ?	
9)	Find the equation of the circle whose center is (1 , 2) and touches the straight line : $3x + 4y + 9 = 0$	

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



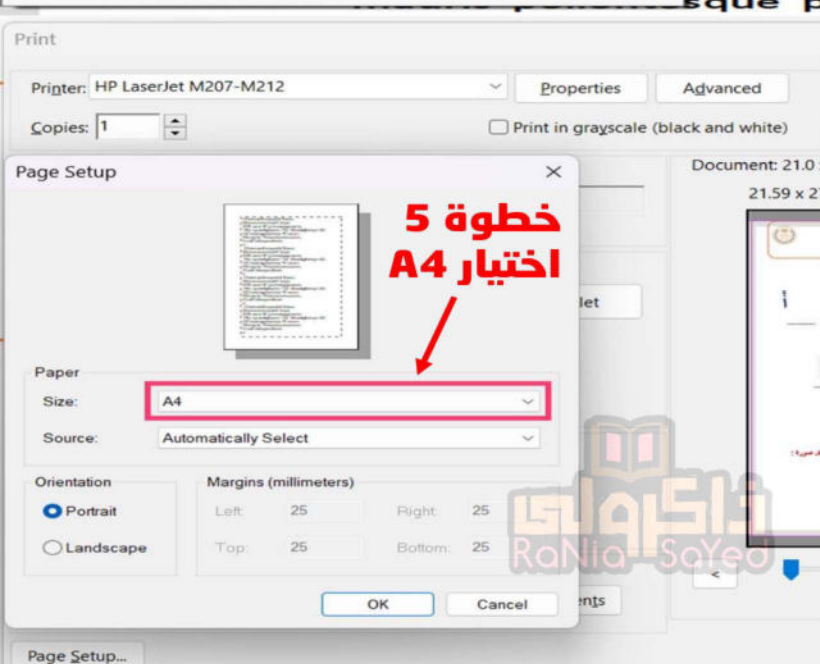
خطوة 1



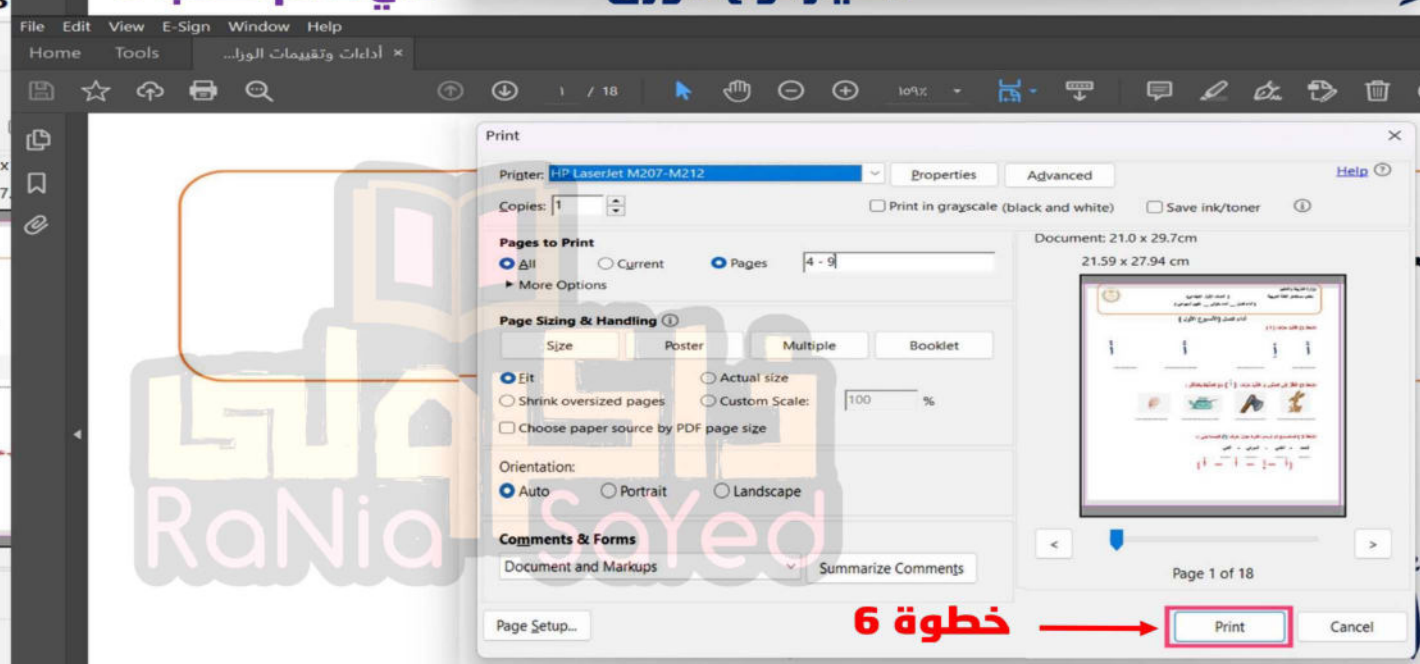
خطوة 2
اختيار اسم
الطابعة
بتاعتك

خطوة 3
كتابة الصفحات
المراد طباعتها
نكتب رقم 4 ثم
نكتب الشرطة
دي - ثم نكتب 9

خطوة 4
اختيار نوع الورق



خطوة 5
اختيار A4



خطوة 6

حمل الآن

مجاناً وحصرياً

المراجعة رقم (2)

الترم الاول



- 1 Two forces of magnitudes $4F$, $5F$ newton , their resultant $9F$ newton , then the measure of the angle included between them =
 (a) 0° (b) 90° (c) 180° (d) 120°
- 2 Two perpendicular forces of magnitudes F , 12 newton , their resultant 13 newton , then $F = \dots\dots\dots N$
 (a) 5 (b) 12 (c) 1 (d) zero
- 3 Two forces of magnitudes F , F newton , their resultant F newton , then the measure of the angle included between them =
 (a) 90° (b) 120° (c) 180° (d) zero
- 4 Two forces of magnitude F , 6 newton , then their resultant perpendicular to the first force , the measure of the angle included between them 120° , then $F = \dots\dots\dots$
 (a) 3 (b) 6 (c) $6\sqrt{2}$ (d) 12
- 5 Two forces of magnitude 3 , 5 newton , then their resultant $\in \dots\dots\dots$
 (a) $[3, 5]$ (b) $]3, 5[$ (c) $[2, 8]$ (d) $]2, 8[$
- 6 Two forces of magnitude 3 , 5 newton , then their resultant $\in \dots\dots\dots$
 (a) $[3, 5]$ (b) $]3, 5[$ (c) $[2, 8]$ (d) $]2, 8[$
- 7 Two forces of magnitudes 4 , 5 newton and the cosine of their included angle is $\frac{-2}{5}$, then the magnitude of their resultant = newton.
 (a) 15 (b) 9 (c) 5 (d) 13
- 8 Two forces act at a point of magnitudes $2F$, $3F$ newton and the magnitude of their resultant $5F$ newton , then the measure of their included angle =
 (a) 0° (b) 60° (c) 120° (d) 180°
- 1 Two forces act at a point their magnitudes are 7 , F newton and their resultant bisects the angle between them , then $F = \dots\dots\dots$ newton.
 (a) 49 (b) 14 (c) 7 (d) $7\sqrt{2}$

- 2 Two forces of magnitudes 3 , F newton act at a point , include an angle of measure 120° and their resultant perpendicular to the first force , then $F = \dots\dots\dots$ newton.
 (a) 0 (b) $3\sqrt{3}$ (c) 1.5 (d) 6
- 3 Two forces of magnitudes 6 N and 8 N. the magnitude of their resultant is 10 N. , then the measure of the angle between them = $\dots\dots\dots$
 (a) 60° (b) 90° (c) 120° (d) 150°
- 4 Two forces of magnitudes F and F act at a particle and the measure of the angle between them is 120° , then their resultant = $\dots\dots\dots$ newton.
 (a) $\sqrt{2} F$ (b) F (c) 2 F (d) $2\sqrt{F}$
- 5 Two forces of magnitude 3 and F newton act at a point the measure of the angle between them is $\frac{2\pi}{3}$, if the resultant is perpendicular to the first force , then $F = \dots\dots\dots$ newton.
 (a) 6 (b) 3 (c) $\sqrt{2}$ (d) 6
- 6 Two forces of magnitudes 8 and 8 N , the measure of the angle between them is 60° , then the magnitude of their resultant is $\dots\dots\dots$ N
 (a) $8\sqrt{3}$ (b) 8 (c) $4\sqrt{3}$ (d) 4
- 7 Two equal forces in magnitude , the magnitude of their resultant = $7\sqrt{3}$ newton and the measure of the included angle is $\frac{\pi}{3}$, then the magnitude of each of them = $\dots\dots\dots$ newton.
 (a) 3 (b) $5\sqrt{3}$ (c) 5 (d) 7
- 8 The force which is in equilibrium with two perpendicular forces F , F newton makes with one of the two forces an angle of measure $\dots\dots\dots^\circ$
 (a) 90 (b) 120 (c) 135 (d) 150
- 9 Two forces act at a point , the magnitude of the two forces are 6 , 3 newton and their resultant is perpendicular to one of them , then the magnitude of their resultant = $\dots\dots\dots$ newton.
 (a) 3 (b) $3\sqrt{3}$ (c) 6 (d) $6\sqrt{3}$
- 1 Two forces are equal in magnitude and each of them equal F newton if the magnitude of the resultant is F newton , then the measure of the included angle = $\dots\dots\dots$
 (a) 0 (b) 30° (c) 60° (d) 120°

- 2 A body of weight W is placed on a smooth inclined plane with the horizontal by an angle of measure θ , then its component in the direction of the line of greatest slope

(a) $W \sin \theta$ (b) $W \cos \theta$ (c) $W \tan \theta$ (d) $W \cot \theta$

- 3 A force of magnitude 12 newtons acts in direction 30° North of the East , then its component in the East direction = newton.

(a) 6 (b) $6\sqrt{3}$ (c) 12 (d) 24

- 4 A force of magnitude 12 newton , acts in the direction of 30° north of west and is resolved into two perpendicular directions , then the magnitude of its component in the west direction = newton.

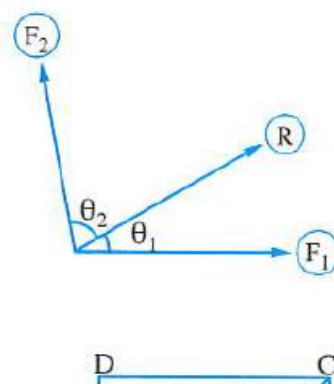
(a) 6 (b) 12 (c) $12\sqrt{3}$ (d) $6\sqrt{3}$

- 5 In the opposite figure :

The force R is resolved into two components

F_1 , F_2 , then : $\frac{F_1}{F_2} = \dots\dots\dots$

(a) $\sin (\theta_1 + \theta_2)$ (b) $\frac{\sin \theta_2}{\sin \theta_1}$
(c) $\frac{\sin \theta_1}{\sin \theta_2}$ (d) $\sin \frac{\theta_1}{\theta_2}$



- 6 A force of magnitude 150 newton acts in the direction 30° North of the west is resolved into two perpendicular components , then the magnitude of the component in North direction = newton.

(a) 30 (b) 75 (c) $75\sqrt{3}$ (d) 150

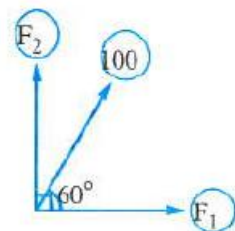
- 7 In the opposite figure :

If the force of magnitude 100 newton

is resolved into two forces $\vec{F}_1$ and $\vec{F}_2$ and the force

is measured by newton , then $(F_1 , F_2) = \dots\dots\dots$

(a) $(50 , 50\sqrt{3})$ (b) $(50\sqrt{3} , 10)$ (c) $(50 , 50)$ (d) $(10 , 10)$



2 The force which is in equilibrium with two perpendicular forces F , F newton makes with one of the two forces an angle of measure°

- (a) 90 (b) 120 (c) 135 (d) 150

3 A force of magnitude $10\sqrt{2}$ newton acts in the direction of East it is resolved into two perpendicular components, one in the direction of eastern north, then the components of the force in the perpendicular direction is newton.

- (a) 10 (b) 20 (c) $10\sqrt{3}$ (d) $10\sqrt{2}$

4 Some coplanar forces meeting at a point, and the sum of their components in the direction of X -axis equal 3 newton and the sum of their components in direction of y -axis equal 4 newton, then their resultant = newton.

- (a) 3 (b) 4 (c) 5 (d) 7

5 Some coplanar forces act at a point, their resultant makes with positive direction of X -axis an angle of tangent $\frac{3}{4}$ and the sum of components of these forces in direction of X -axis equal 12 newton, then the sum of their component in direction of y -axis = newton

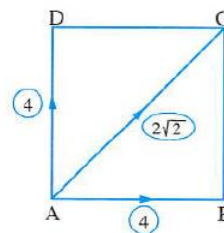
- (a) 9 (b) 12 (c) 16 (d) 20

6 If $\vec{F}_1 = 2\hat{i} + 3\hat{j}$, $\vec{F}_2 = \hat{i} + \hat{j}$, then the magnitude of their resultant = force unit.

- (a) $\sqrt{2}$ (b) $\sqrt{13}$ (c) 5 (d) 25

7 In the opposite figure :

ABCD is a square, the forces 4, 4, $2\sqrt{2}$ newton act in the directions of $\overrightarrow{AB}$, $\overrightarrow{AD}$, $\overrightarrow{AC}$ respectively, then the magnitude of their resultant = newton.



- (a) 6 (b) $10\sqrt{2}$ (c) $6\sqrt{2}$ (d) $6\sqrt{3}$

8 ABCD is a rectangle $AB = 4$ cm, $BC = 3$ cm, forces of magnitudes 4, 10, 6 newton act along $\overrightarrow{AB}$, $\overrightarrow{AC}$, $\overrightarrow{AD}$ respectively, the resultant of these forces makes with $\overrightarrow{AB}$ an angle of measure

- (a) 45° (b) 60° (c) 30° (d) 90°

2 Which of the following sets of forces could not be in equilibrium ?

(a) 11 , 7 , 5 newton.

(b) 4 , 6 , 8 newton.

(c) 10 , 10 , 8 newton.

(d) 8 , 4 , 14 newton.

3 In the opposite figure :

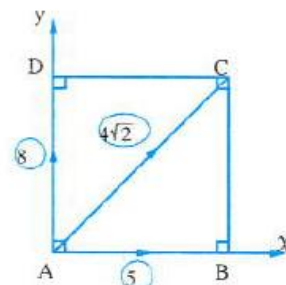
ABCD is a square , the forces of magnitudes 5 , 8 , $4\sqrt{2}$ newton act on $\overrightarrow{AB}$, $\overrightarrow{AD}$ and $\overrightarrow{AC}$ respectively , then the polar form of the resultant is

(a) (5 , 54°)

(b) (15 , 60°)

(c) (15 , $53^\circ 8'$)

(d) (13 , 90°)



4 If $\vec{F}_1 = \hat{i} - \hat{j}$, $\vec{F}_2 = 2\hat{i} - 4\hat{j}$, $\vec{R} = 2a\hat{i} - 3b\hat{j}$, then $a + b = \dots\dots\dots$

(a) 3

(b) $3\frac{1}{3}$

(c) $3\frac{1}{6}$

(d) 12

5 Two equilibrium forces , $\vec{F}_1 = (4 , a)$ and $\vec{F}_2 = (b , -5)$, then $a + b = \dots\dots\dots$

(a) 1

(b) -1

(c) 9

(d) -9

6 In the opposite figure :

the forces are in equilibrium

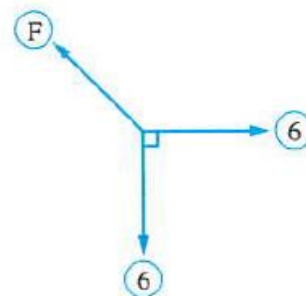
, then $F = \dots\dots\dots$

(a) 6

(b) $6\sqrt{2}$

(c) $5\sqrt{2}$

(d) 12



7 In the opposite figure :

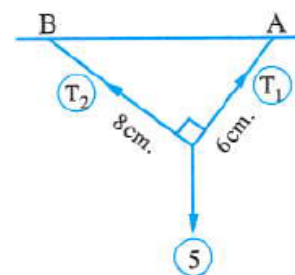
$T_1 \times T_2 = \dots\dots\dots$

(a) 6

(b) $6\sqrt{2}$

(c) $3\sqrt{2}$

(d) 12



A

2

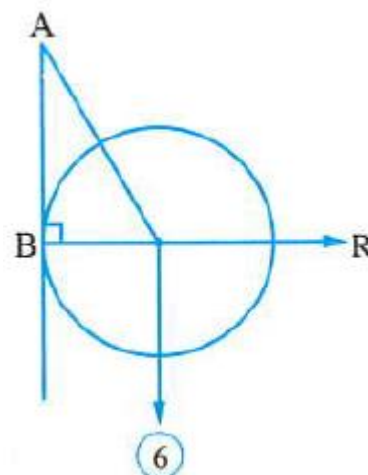
A sphere of weight 6 N attached by a string of length equal the radius length of the sphere , then the reaction of the wall = N

(a) $2\sqrt{3}$

(b) 6

(c) $6\sqrt{3}$

(d) 12



3

A body of weight 12 newton is placed on an inclined plane with the horizontal by an angle of measure 30° , if the body kept in equilibrium under the action of a horizontal force. Find the magnitude of this force and the normal reaction of the plane.

4

In the opposite figure :

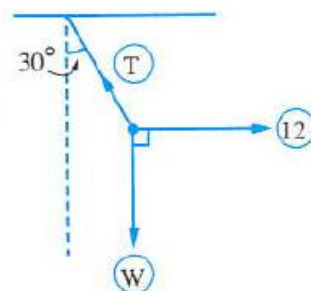
A body is suspended by the end of a string and its other end fixed at the ceiling of a room. A horizontal force of magnitude 12 gm.wt. pulled the body until the string inclines to the vertical by an angle of measure 30° , then the weight of the body = gm.wt.

(a) $12\sqrt{3}$

(b) $3\sqrt{12}$

(c) 12

(d) 15



5

If a body is in equilibrium under the action of three coplanar forces , meeting at a point and their magnitudes are 7 , 8 , 5 newton , then the measure of the angle between the second and the third forces =

(a) 150°

(b) 120°

(c) 90°

(d) 60°

1

In the opposite figure :

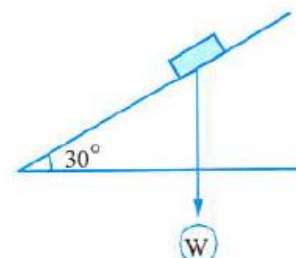
A body of weight (W) is placed on a smooth inclined plane inclines to the horizontal by an angle of measure 30° , then the component of its weight along the greatest slope of the plane is

(a) W

(b) $W \sin 30^\circ$

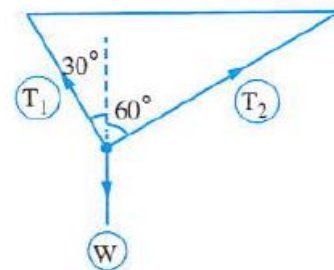
(c) $W \cos 30^\circ$

(d) $W \tan 30^\circ$



2 In the opposite figure :

A body of weight 36 kg.wt. is suspended by two strings incline to the vertical by angles of measures 30° , 60° , then : $T_1 + T_2 = \dots\dots\dots$ kg.wt.



- (a) 45 (b) $9 + 18\sqrt{3}$
(c) $36 + 18\sqrt{3}$ (d) $18(1 + \sqrt{3})$

3 A body of weight 100 gm.wt. is suspended by two strings of lengths 60 cm. , 80 cm. , the other two ends are fixed at two points on the same horizontal line and the distance between them equals 100 cm. Find the tension in each string in the equilibrium position.

4 The difference between the greatest and smallest values of the resultant of two forces of magnitudes 5 and 8 newton =

- (a) 5 (b) 8 (c) 10 (d) 13

5 If the forces $\vec{F}_1 = a\vec{i} - 6\vec{j}$, $\vec{F}_2 = -3\vec{i} + 4\vec{j}$, $\vec{F}_3 = 9\vec{i} + 2\vec{j}$ are equilibrium , then a =

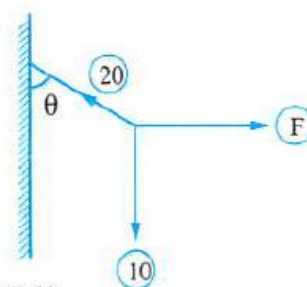
- (a) 6 (b) -6 (c) 1 (d) 15

6 A body of weight 6 newton is placed on a smooth plane inclined to the horizontal at an angle of measure 30° , it is kept in equilibrium by a horizontal force , then the magnitude of the reaction of the plane = N.

- (a) $2\sqrt{3}$ (b) $3\sqrt{3}$ (c) $4\sqrt{3}$ (d) $8\sqrt{3}$

1 In the opposite figure :

A body of weight 10 N , is suspended by a string which inclines to the vertical by an angle of measure θ , it is in equilibrium under the effect of a horizontal force F , then $\theta = \dots\dots\dots$



- (a) 30° (b) 45° (c) 60° (d) 75°

2 In the opposite figure :

The system is in equilibrium

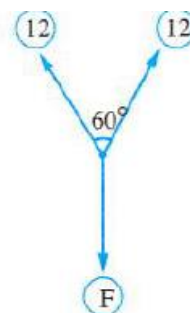
, then $F = \dots\dots\dots$ newton.

(a) $12\sqrt{2}$

(b) $12\sqrt{3}$

(c) 6

(d) 12



3 A uniform sphere of weight 24 newton and its radius length 6 cm. If it is in equilibrium by a string of length 4 cm. attached to a point of its surface and the other end of the string is fixed at a point in the vertical smooth wall. Find the tension of the string and the reaction of the wall.

4 Three coplanar forces $\vec{F}_1 = 6\hat{i} + 7\hat{j}$, $\vec{F}_2 = a\hat{i} - 9\hat{j}$, $\vec{F}_3 = 5\hat{i} + b\hat{j}$ act at a particle and they are in equilibrium , then $a + 2b = \dots\dots\dots$

(a) -9

(b) 5

(c) 7

(d) -7

5 In the opposite figure :

A body of weight 90 gm.wt. is attached to the end of a string of 30 cm. long the body is pulled by a horizontal force.

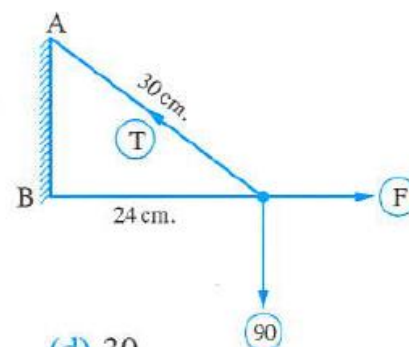
It comes to equilibrium when it is 24 cm. apart from wall $\overline{AB}$, then $T - F = \dots\dots\dots$ gm.wt.

(a) 150

(b) 120

(c) 50

(d) 30



1 In the opposite figure :

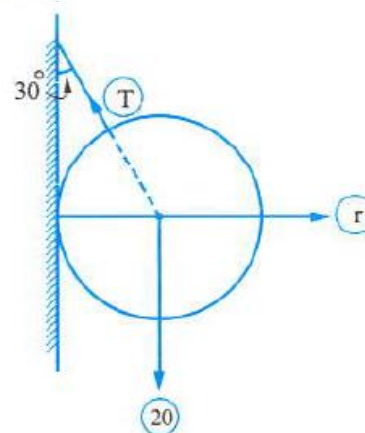
A smooth sphere of weight 20 newton rests against a smooth vertical wall. It is suspended at a point on its surface by means of a string and the other end is fixed to the wall at a point lies directly above the point of tangency of the sphere and the wall , if the string makes with the vertical an angle of measure 30° , then in case of equilibrium $T : r = \dots\dots\dots$

(a) 2 : 1

(b) 1 : 2

(c) $\sqrt{3} : 1$

(d) $2 : \sqrt{3}$

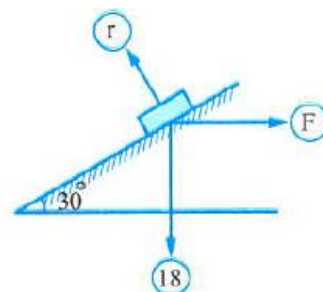


- 2 A smooth sphere of weight 15 newton is on a smooth vertical wall and suspended by a light string from a point on its surface. The other end of the string is attached to a point on the wall above the point of contact between the wall and the sphere. If the length of the string equals the radius length of the sphere. Find the pressure on the wall and the tension in the string in case of equilibrium.

- 3 **In the opposite figure :**

A body of weight 18 newton is placed on a smooth inclined plane to the horizontal at an angle of measure 30° is in equilibrium under the effect of a horizontal force $\vec{F}$

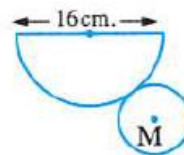
Find : the value of each of F , r



- 4 The weight of a body is 200 gm.wt. It is tied by two perpendicular strings their lengths are 60 cm. , 80 cm. and the other ends are fixed on the same horizontal line , find the difference between the tensions in the two strings.
- 5 The forces of magnitudes F , 6 , $4\sqrt{2}$, $5\sqrt{2}$ and K measured in newton are act at a point in the directions east , north , north west , west south and south respectively. Find the values of F and K if the resultant of forces = 2 newton act in north direction.
-
- 6 ABCDHE is a regular hexagon. Forces of magnitudes 2 , $4\sqrt{3}$, 8 , $2\sqrt{3}$ and 4 kg.wt. act at point A in directions $\overrightarrow{AB}$, $\overrightarrow{AC}$, $\overrightarrow{AD}$, $\overrightarrow{AH}$, $\overrightarrow{AE}$ respectively. Find the magnitude and the direction of their resultant.

- 1 The two skew lines are
(a) not intersecting. (b) not parallel.
(c) not lie on one plane. (d) all the previous.
- 2 The least number of non-collinear points that determine a plane
(a) one. (b) two. (c) three. (d) four.
- 3 The least number of non-collinear points that determine a plane
(a) one. (b) two. (c) three. (d) four.
- 4 The least number of non-collinear points that determine a plane
(a) one. (b) two. (c) three. (d) four.
- 5 The base of the quadrilateral regular pyramid is a
(a) triangle. (b) square. (c) rectangle. (d) rhombus.
- 6 In the regular pyramid : the heighth the slant height.
(a) < (b) > (c) $\leq$ (d) $\geq$
- 7 The least number of planes that determine a solid is
(a) 2 (b) 3 (c) 4 (d) 5
- 8 The two straight lines are skew if they are
(a) Not contained in one plane (b) Not parallel
(c) Not perpendicular (d) Not intersecting
- 9 The least number of planes that determine a solid is
(a) 2 (b) 3 (c) 4 (d) 5
- 10 Number of planes that are passing through two different parallel straight lines =
(a) 1 (b) 2 (c) 3 (d) an infinite number.
- 1 A triangular pyramid of regular faces , its edge length 6 cm. , then its volume = cm^3 .
(a) 36 (b) 216 (c) $216\sqrt{2}$ (d) $18\sqrt{2}$

- 2 If the side length of the base of a regular quadrilateral pyramid equals 40 cm. and its height equals $20\sqrt{3}$ cm. , then its lateral surface area = cm^2
 (a) 3200 (b) 4300 (c) 6300 (d) 3400
- 3 A triangular regular faces pyramid , its edge length 10 cm. , then its total area equal cm^2
 (a) 40 (b) 100 (c) $100\sqrt{3}$ (d) $25\sqrt{3}$
- 4 A regular quadrilateral pyramid whose base perimeter is 36 and its height 10 cm. , then its volume = cm^3
 (a) 180 (b) 270 (c) 360 (d) 810
- 5 The ratio between the edge length of the triangular pyramid of regular faces and its height =
 (a) $\sqrt{2} : \sqrt{3}$ (b) $\sqrt{3} : 2$ (c) $\sqrt{6} : 3$ (d) $\sqrt{6} : 2$
- 6 A right cone , its lateral area $18\pi \text{ cm}^2$, its drawer length 6 cm. , then the length of radius of its base = cm.
 (a) 3 (b) 6 (c) 9 (d) 12
- 7 The volume of a right cone which the circumference of its base equals 44 cm. and its height 15 cm. equals cm^3 . (where $\pi = \frac{22}{7}$)
 (a) 110 (b) 235 (c) 245 (d) 770
- 8 If we fold the shown net , it becomes a cone.
 Its base radius length is cm.
 (a) 2.5 (b) 4 (c) 8 (d) 16
- 9 If the length of the diameter of the base of a right circular cone is 12 cm. and its height 8 cm. , then its lateral area equal cm^2
 (a) 60π (b) 28π (c) 10π (d) 48π



- 1 If the equation of a circle $x^2 + y^2 = 36$, then its area = cm^2
 (a) 36 (b) 6π (c) 12π (d) 36π
- 2 If the equation of a circle is $x^2 + y^2 + 4x - 6y - 10 = 0$, then its centre is
 (a) (4, -6) (b) (2, -3) (c) (-2, 3) (d) (-4, 6)
- 3 The circumference of the circle whose equation : $(x - 3)^2 + (y + 5)^2 = 25$ is length units.
 (a) 2π (b) 3π (c) 10π (d) 25π
- 4 The length of diameter of the circle whose equation is : $4x^2 + 4y^2 + 16x - 8y - 16 = 0$ equals length unit.
 (a) 3 (b) 6 (c) 12 (d) 24
- 5 If the radius length of the base of a right circular cone = 6 cm., and its height = 8 cm., then its lateral surface area = cm^2 .
 (a) 60π (b) 48π (c) 69π (d) 96π
- 6 If the length of the diameter of the base of a right circular cone is 12 cm. and its height 8 cm., then its lateral area equal cm^2 .
 (a) 60π (b) 28π (c) 10π (d) 48π
- 7 The area of the circle whose equation is : $(x - 5)^2 + (y + 4)^2 = 7$ equals square unit.
 (a) 3.5π (b) 7π (c) 12.25π (d) 49π
- 8 The equation of the circle whose centre (4, 3) and touches X-axis is
 (a) $(x - 3)^2 + (y - 4)^2 = 16$ (b) $(x - 4)^2 + (y - 3)^2 = 9$
 (c) $(x + 3)^2 + (y + 4)^2 = 9$ (d) $(x + 3)^2 + (y - 4)^2 = 16$
- 1 Form the general equation of the circle in which $\overline{AB}$ is diameter of it where :
 A (6, -4) , B (0, 2)

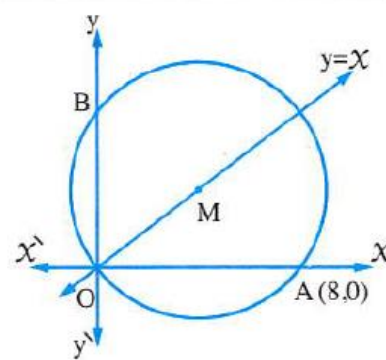


- 2 A regular quadrilateral pyramid , the perimeter of its base = 40 cm. and its height 13 cm. find its volume.
- 3 Find the equation of the circle whose centre is $(7, -5)$ and passes through the point $(3, -2)$
- 4 A regular quadrilateral pyramid whose base area is 9 cm^2 and the length of its lateral edge is 5 cm. Find its volume.
- 5 Write the general form of the equation of the circle whose center is $(-2, 3)$ and the length of its diameter is 18 length units.
- 6 Determine the position of the circle $C_1 : (x-5)^2 + (y+2)^2 = 4$ with respect to the circle $C_2 : (x+7)^2 + (y-3)^2 = 1$

7 **In the opposite figure :**

A circle its center $M \in$ the straight line $y = x$

Find the equation of the circle.

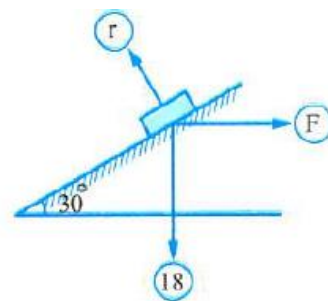


- 8 **Find the equation of the circle which the straight line : $3x + 4y + 23 = 0$ touches it and its centre is $(1, 1)$.**
- 9 A regular quadrilateral pyramid , the side length of its base is 18 cm. , if its volume is 1296 cm^3 . Find the slant height and lateral surface area.
- 10 A regular quadrilateral pyramid the length of its base is 20 cm. , and its height is $10\sqrt{3} \text{ cm}$.
Find : Its lateral surface area

In the opposite figure :

A body of weight 18 newton is placed on a smooth inclined plane to the horizontal at an angle of measure 30° is in equilibrium under the effect of a horizontal force $\vec{F}$

Find : the value of each of F , r



The weight of a body is 200 gm.wt. It is tied by two perpendicular strings their lengths are 60 cm. , 80 cm. and the other ends are fixed on the same horizontal line , find the difference between the tensions in the two strings.

The forces of magnitudes F , 6 , $4\sqrt{2}$, $5\sqrt{2}$ and K measured in newton are act at a point in the directions east , north , north west , west south and south respectively. Find the values of F and K if the resultant of forces = 2 newton act in north direction.

ABCDHE is a regular hexagon. Forces of magnitudes 2 , $4\sqrt{3}$, 8 , $2\sqrt{3}$ and 4 kg.wt. act at point A in directions $\vec{AB}$, $\vec{AC}$, $\vec{AD}$, $\vec{AH}$, $\vec{AE}$ respectively. Find the magnitude and the direction of their resultant.

A metal sphere of weight 400 kg.wt acts in its centre , placed between two smooth planes , one of them is vertical and the other inclined at angle of measure 60° with vertical , then find the reaction of each plane.

A body of weight 20 kg.wt. is placed on a smooth plane inclined to the horizontal with an angle of measure θ where $\cos \theta = \frac{4}{5}$ the body of kept in equilibrium by a horizontal force of magnitude F . **Find :** F and the reaction of the plane.

In the oppostie figure :

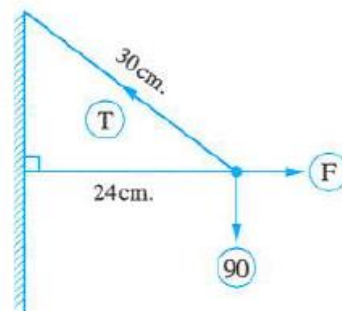
$T - F = \dots\dots\dots$ gm.wt.

(a) 150

(b) 30

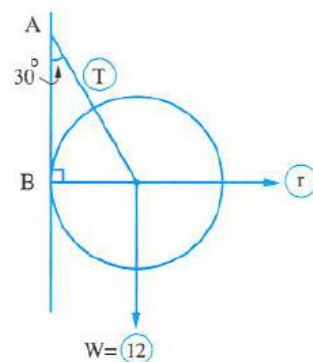
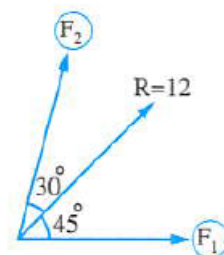
(c) 50

(d) 120



ABCDEF is a regular hexagon , the forces of magnitudes 6 , $2\sqrt{3}$, 6 , $2\sqrt{3}$ newton act on $\vec{AB}$, $\vec{AC}$, $\vec{AD}$ and $\vec{AE}$ respectively. Find the magnitude of the resultant of these forces.

- 1 The case that doesn't determine a plane is
- (a) two intersecting straight lines. (b) two different parallel straight lines.
(c) three points not collinear. (d) straight line and point on it.
- 2 Two forces of magnitudes 8 , F newton , the angle between them $\theta \in]0 , \pi[$ their resultant bisects the angle between them , then F = newton.
- 3 If the circle whose equation : $x^2 + y^2 - 6x + 8y + c = 0$ touches X-axis , then c =
- 4 If θ is the measure of the angle between two forces of magnitudes 2 N , 6 N and R is the resultant between them by newton where $4 \leq R < 8$, then angle between them $\in$
- 5 **In the opposite figure :**
R = 12 newton
, then $F_1 =$ newton.
- (a) $12 \cos 45^\circ$ (b) $12 \sin 45^\circ$
(c) $6 \csc 45^\circ$ (d) $6 \csc 75^\circ$
- 6 Two forces of magnitudes 12 N , 15 N acting at a point and angle between them θ° where $\cos \theta^\circ = \frac{-4}{5}$, then the angle between resultant and first force =
- 7 If $\vec{F}_1, \vec{F}_2, \vec{F}_3$ are three forces intersect at a point and equilibrium where $\vec{F}_1 = (2, -5)$, $\vec{F}_2 = (-3, 2)$, then $\vec{F}_3 =$
- 8 If $\vec{F}_1 = 3\hat{i} - 2\hat{j}$, $\vec{F}_2 = a\hat{i} - \hat{j}$, $\vec{F}_3 = 4\hat{i} - b\hat{j}$, and the resultant $\vec{R} = 6\hat{i} - 4\hat{j}$, then (a , b) =
- 9 **In the opposite figure :**
If the sphere is in equilibrium
, then (T , r) = newton.
- (a) (4 , 8) (b) (12 , 8)
(c) $(4\sqrt{3}, 8\sqrt{3})$ (d) $(8\sqrt{3}, 4\sqrt{3})$
- 10 The volume of triangular regular faces pyramid its edge length 6 cm. = cm^3



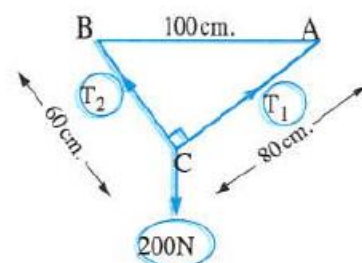
W=12

- 11 A right circular cone the length of its drawer 25 cm. and its lateral area 550 cm^2 , then its volume = cm^3 ($\pi = \frac{22}{7}$)

(a) 1223 (b) 1232 (c) 1322 (d) 3122

- 12 In the opposite figure :

A body its weight 200 N is hanged by two strings
 , then the magnitude of the tension
 in the two strings = N



- 13 If the length of the radius of right circular cone 3 cm. and its height 4 cm.
 , then its total area = cm^2

- 14 Three coplanar forces of magnitude 5 , 6 , 7 newton act at a particle if the forces are in equilibrium , then the cosine of the angle between the second and the third force =

- 15 The point that lies on the circle : $(X + 2)^2 + y^2 = 13$ from the following is

- 16 Any four points don't lie in one plane determine

(a) one plane. (b) two planes. (c) three planes. (d) four planes.

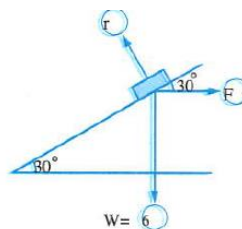
- 17 Three coplanar forces not on the same straight line meeting at a point are in Equilibrium the magnitudes of them are 4 , 8 , F , then F could be N

- 18 A body of weight 6 newton is placed on smooth plane inclined to the horizontal at an angle 30° it kept in equilibrium by horizontal force of magnitude F , then
 F = newton.

- 19 In the opposite figure :

r =

(a) $2\sqrt{3}$ (b) $3\sqrt{3}$
 (c) $4\sqrt{3}$ (d) $6\sqrt{3}$



- 20 In the previous figure :

The component of the weight in the direction
 of the greatest slope to the bottom = N

حمل الآن

مجاناً وحصرياً

المراجعة رقم (3)

الترم الاول





First term

Sec 2

Math applications

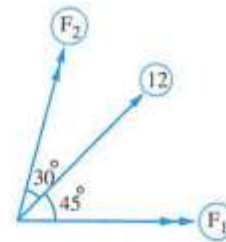


Math department

- 1) If the resultant of the two forces F and $3F$ kg.wt. is perpendicular to one of them, then the magnitude of their resultant equals kg.wt.
(a) $\sqrt{2}F$ (b) $4F$ (c) $2\sqrt{2}F$ (d) $2F$
- 2) If the resultant of two forces meeting at one point is $R \in [5, 19]$, where $F_1 > F_2$, then $F_1 =$
(a) 7 (b) 12 (c) 5 (d) 19
- 3) Two perpendicular forces of magnitudes $2F - 5$, $F + 2$ newton act at a particle, the magnitude of their resultant is $3\sqrt{5}$ newton. , then $F =$ newton.
(a) 2 (b) 3 (c) 4 (d) 5
- 4) Three forces meeting at one point are in equilibrium, if the magnitudes of two forces of them equals 7, 3 newton, then the value of the third force may be equals newton.
(a) 11 (b) 2 (c) 5 (d) 3
- 5) If the forces $\vec{F}_1 = (a, 7)$, $\vec{F}_2 = (-5, -b)$, $\vec{F}_3 = (1, 1)$ are equilibrium, then $(a, b) =$
(a) (4, 2) (b) (1, 2) (c) (4, 8) (d) (-4, -8)
- 6) Two forces of magnitude 16, F gm.wt. the measure of the angle between them $\in]0, \pi[$ and the resultant bisects the angle between them, then $F =$ gm.wt.
(a) 4 (b) 8 (c) 12 (d) 16
- 7) Two forces of magnitudes $5F$, $2F$ newton act at a point, the magnitude of their resultant is $7F$, then the measure of the angle between them =
(a) 0° (b) 90° (c) 180° (d) 60°
- 8) Two forces of magnitude 4, F newton act at a point, the measure of the angle between them is 120° , if the resultant is perpendicular to the first force, then the resultant = N.
(a) $4\sqrt{2}$ (b) $4\sqrt{3}$ (c) $4\sqrt{5}$ (d) 4



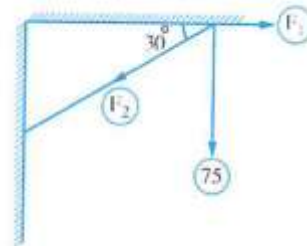
- 9) If the force 12 N, is resolved into two components F_1 and F_2 , then $F_1 = \dots\dots\dots$ N



- (a) $12 \cos 75^\circ$ (b) $12 \cos 45^\circ$
(c) $6 \csc 45^\circ$ (d) $6 \csc 75^\circ$
- 10) A body (w) is placed on plane inclined by angle (θ) to the horizontal, then the magnitude of the component of its weight in direction perpendicular to the plane
- (a) $w \sin \theta$ (b) $w \cos \theta$ (c) $w \tan \theta$ (d) $w \csc \theta$
- 11) A body of weight (W) newton is placed on a smooth plane inclined with the horizontal at an angle of measure 30° and kept in equilibrium by the effect of force of magnitude 36 newton acts in the direction of the line of greatest slope of the plane upwards, then the magnitude of the weight = newton.
- (a) 36 (b) $72\sqrt{3}$ (c) 72 (d) $36\sqrt{3}$

- 12) **In the opposite figure :**

A vertical force of magnitude 75 newton is resolved into two components, one of them is horizontal (F_1) and the other F_2 , then $F_2 = \dots\dots\dots$ newton.



- (a) 75 (b) $75\sqrt{3}$
(c) 150 (d) $150\sqrt{3}$
- 13) Force of magnitude $4\sqrt{2}$ N, acts in east direction. It is resolved into two perpendicular directions, then its component in the direction of north of the east equals N.
- (a) zero (b) $4\sqrt{2}$ (c) 4 (d) 6
- 14) A body of weight (W) newton is suspended by two light strings inclined to the vertical by angles θ° and 30° the body becomes in equilibrium when the tension of the first string equal 12 newton, and the other is $12\sqrt{3}$ newton, then the weight of the body $W = \dots\dots\dots$ N.

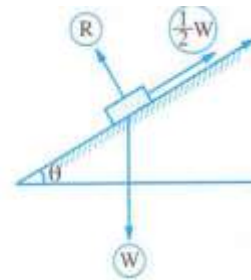
- (a) 60 (b) 25 (c) 36 (d) 24
- 15) If $\vec{F}_1$, $\vec{F}_2$ are two forces, then the measure of the angle enclosed between $\vec{F}_1$ and the resultant of the two forces $(\vec{F}_1 + \vec{F}_2)$, $(\vec{F}_1 - \vec{F}_2)$ equals
- (a) zero. (b) $\tan^{-1} \left(\frac{F_1}{F_2} \right)$ (c) $\tan^{-1} \left(\frac{F_2}{F_1} \right)$ (d) $\tan^{-1} \left(\frac{F_1 - F_2}{F_1 + F_2} \right)$



16) In the opposite figure :

If the body is in equilibrium under acting of the shown forces , then $m (\angle \theta) = \dots\dots\dots$

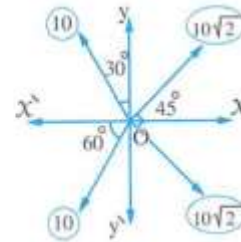
- (a) 30° (b) 60°
(c) 45° (d) 15°



17) In the opposite figure :

The resultant of the system of forces "R" = $\dots\dots\dots$ newton.

- (a) 20 (b) $10\sqrt{2}$
(c) 10 (d) zero.



18) If the three coplanar forces $\vec{F}_1 = 5\hat{i} + 3\hat{j}$, $\vec{F}_2 = a\hat{i} + 6\hat{j}$, $\vec{F}_3 = -14\hat{i} + b\hat{j}$ act at a point and their resultant $\vec{R} = (10\sqrt{2}, \frac{3}{4}\pi)$, then $a + b = \dots\dots\dots$

- (a) -1 (b) 1 (c) zero. (d) 14

19) In the opposite figure :

$\overline{AB}$ is a uniform rod fixed to a hinge at A to a vertical wall.

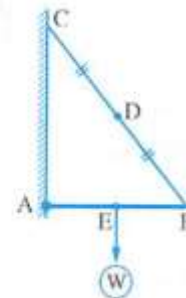
It's kept horizontally by a string fixed to point B and

the other end of the string is fixed to point C

on the wall above A.

Which of the following is the triangle of force ?

- (a) $\triangle DBE$ (b) $\triangle DEA$ (c) $\triangle ADE$ (d) $\triangle ACD$



20) The ratio between the edge length of the triangular regular faces pyramid : its height = $\dots\dots\dots$

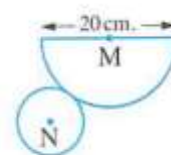
- (a) $\sqrt{2} : \sqrt{3}$ (b) $\sqrt{3} : 2$ (c) $\sqrt{6} : 2$ (d) $\sqrt{3} : 3$

21) Three coplanar forces of magnitudes 60 , F and K newton meeting at a point and in equilibrium. If the angle between the 1st and the 2nd forces measures 120° and between the 2nd and the 3rd measures 90° , then the value of K = $\dots\dots\dots$ newton.

- (a) $30\sqrt{3}$ (b) $30\sqrt{2}$ (c) 30 (d) 60



- 22) A right cone of volume $27 \pi \text{ cm}^3$, circumference of its base $6 \pi \text{ cm}$,
then its height. = cm.
(a) 27 (b) 3 (c) $3\sqrt{3}$ (d) 9
- 23) A regular quadrilateral pyramid, the side length of its base 10 cm., and its slant height 13 cm., then its lateral area = cm^2 .
(a) 260 (b) 360 (c) 130 (d) 520
- 24) If we folded the opposite net to become a cone
then the radius length of its base = cm.
(a) 10 (b) 8
(c) 5 (d) 2.5
- 25) The volume of right cone, where the length of its drawer 15 cm. and the total surface area = $216 \pi \text{ cm}^2$ equals cm^3 .
(a) 205π (b) 320π (c) 380π (d) 324π
- 26) The radius length of the base of a right circular cone is 15 cm., and its height = 20 cm., then its lateral area = cm^2 .
(a) 600π (b) 375π (c) 1875π (d) 5625π
- 27) The centre of the circle : $2x^2 + 2y^2 - 6x + 8y = 0$ is the point
(a) (3, -4) (b) (-4, 3) (c) $(\frac{3}{2}, -2)$ (d) (-3, -4)
- 28) The least number of planes could form a solid is
(a) 1 (b) 2 (c) 3 (d) 4
- 29) If $\vec{F}_1 = 2\hat{i} - 2\hat{j}$, $\vec{F}_2 = 4\hat{i} - 8\hat{j}$ and their resultant $\vec{R} = 2a\hat{i} - 3b\hat{j}$, then $a + b =$
(a) 3 (b) $3\frac{1}{3}$ (c) $6\frac{1}{3}$ (d) 12
- 30) The equation of the circle with area 81π square units and its centre lies in the second quadrant and touches the y-axis could be
(a) $(x+3)^2 + (y-5)^2 = 25$ (b) $(x+4)^2 + (y-3)^2 = 25$
(c) $(x-6)^2 + (y+4)^2 = 36$ (d) $(x+9)^2 + (y-14)^2 = 81$





31) Which of the following equations represent equation of a circle ?

(a) $3x^2 + 2y^2 + 6x - 8y - 10 = 0$

(b) $x^2 + y^2 + 4x + 25 = 0$

(c) $2x^2 + 2y^2 - 12x + 8y - 30 = 0$

(d) $x^2 + y^2 + 2xy + 3 = 0$

32) The equation $(x \ y \ 8) \begin{pmatrix} x \\ y \\ -2 \end{pmatrix} = \square$

represents a circle its diameter length = length unit.

(a) 2

(b) 4

(c) 6

(d) 8

33) A right circular cone its base touch the two positive axes in x y -plane and its drawer is twice its radius base length , the volume of a cone is $72\sqrt{3}\pi \text{ cm}^3$,
then the equation of its base is

(a) $(x-5)^2 + (y-5)^2 = 25$

(b) $(x-3)^2 + (y-3)^2 = 9$

(c) $(x-6)^2 + (y-6)^2 = 36$

(d) $(x-2)^2 + (y-2)^2 = 4$

34) A regular pyramid its base is hexagon its side length 8 cm. and its height 10 cm.
then its volume equal = cm^3 .

(a) $320\sqrt{3}$

(b) $960\sqrt{3}$

(c) $160\sqrt{3}$

(d) 554.35

35) In the opposite figure :

A body of weight 150 gm. wt.

is in equilibrium by suspended by two perpendicular

strings their lengths are 60 cm. , 45 cm.

and the other ends are fixed at C and B

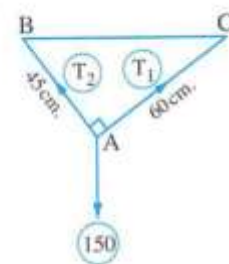
on the same horizontal line, then $T_2 - T_1 = \dots\dots\dots$ gm.wt.

(a) 120

(b) 90

(c) 60

(d) 30



36) Two lines are skew if

(a) they are not parallel.

(b) they are not intersecting.

(c) they are not coincident.

(d) they are not on the same plane.



- 37) The least number of planes can determine a solid is planes.
(a) three (b) four (c) two (d) five
- 38) In a triangular pyramid of regular faces , if the sum of lengths of its edges = 36 cm.
 , then the height of the pyramid = cm.
(a) $\sqrt{6}$ (b) $2\sqrt{6}$ (c) 6 (d) 4

Essay questions :

- 1) A sphere of radius length 10 cm. and of weight 30 gm.wt. is suspended from a point on its surface by a string of length 10 cm. , the other end of the string is fixed on a smooth vertical wall. Find in case of equilibrium the tension of the string and the reaction of the wall.
- 2) $\overline{AB}$ is a uniform rod of weight 20 kg.wt. the end A attached to a hinge fixed on a vertical wall a horizontal force F acts at B , the rod is in equilibrium when it inclined by angle 30° with vertical , find the magnitude of each of the force and reaction of the hinge.
- 3) $\overline{AB}$ is a uniform rod with length 60 cm. and weight 40 newton is connected to a hinge on the vertical wall at A , if the rod kept in equilibrium horizontally by a light string connected to the rod at B and with point C on the wall just above A and at a distance 60 cm. from A , find the tension on the string and the reaction on the hinge at A
- 4) Write the general form of the equation of the circle if the two points A (4 , 2) , B (− 1 , − 3) are the end points of its diameter.
- 5) A regular quadrilateral pyramid , the side length of its base is 18 cm. , its volume 1296 cm^3 find its slant height and its lateral surface area.
- 6) Write the equation of the circle which touches the X-axis at the point (− 2 , 0) and intercepts from the positive part of y-axis a chord of length $4\sqrt{3}$ length unit.

حمل الآن

مجاناً وحصرياً

المراجعة رقم (4)

الترم الاول





عالم لغز لغز

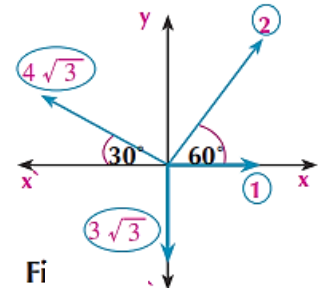
وزارة التربية والتعليم
الإدارة المركزية لتطوير المناهج
مكتب مستشار الرياضيات

Model Exam of Second year secondary First Term 2023- 2024
Math Applications Time: 3 hours

استرشادى تطبيقات رياضيات للصف الثانى الثانوى للعام الدراسى ٢٠٢٣ / ٢٠٢٤ م

First: Choose the correct answer

- Two forces of magnitudes 3, 5 Newtons act at a point. The measure of the angle between them is 60° . Then, The magnitude of their resultant =..... Newton.
A 7 B 6 C 5 D 9
- Two forces of magnitudes F_1, F_2 ($F_1 < F_2$), mag. Of their resultant $\sqrt{3}F_1$. and the resultant inclines 30° to the force F_2 , then $F_1 : F_2 = \dots$
A 1 : 2 B 1 : 3 C $1 : \sqrt{3}$ D $\sqrt{3} : 2$
- The forces $\vec{F}_1, \vec{F}_2$ are opposite in direction, then their resultant equals
A $F_1 + F_2$ B $\vec{F}_1 - \vec{F}_2$ C $F_1 - F_2$ D $\vec{F}_1 + \vec{F}_2$
- A body of weight 6 newton is placed on a smooth plane inclined to the horizontal by an angle of measure 30° . then the components of the weight in the direction of the line of the greatest slopenewton
A 12 B 6 C 3 D $3\sqrt{3}$
- If the force $\vec{R}$ is resolved into two components $\vec{F}_1, \vec{F}_2$ which make with the force $\vec{R}$ two angles of measures $30^\circ, 45^\circ$ from different directions of its line of action, $||\vec{R}|| = 12$ newton, then $F_1 = \dots\dots\dots$ Newton, $F_2 = \dots\dots\dots$ Newton respectively
A 8.8, 6.2 B 6.2, 8.8 C 8.8, 9.2 D 9.2, 8.8
- If the resultant of the two forces $\vec{F}_1 = 3\hat{i} - \hat{j}$, $\vec{F}_2 = 5\hat{i} - 6\hat{j}$ is $\vec{R} = 2a\hat{i} - 7b\hat{j}$, then $a = \dots, b = \dots$ respectively
A 1, 4 B 3, -4 C -3, 4 D 4, 1
- In the opposite figure
If the resultant is $\vec{R} = a\hat{i} + b\hat{j}$, then $b = \dots$



خاتمة مع

- A -4 B Zero C 3 D 4



عاشور لغز الصناد

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- 8) If $\vec{R}$ is the resultant of the two forces $\vec{F}_2, \vec{F}_1$, θ is the measure of the angle between $\vec{F}_1, \vec{F}_2$ and $\frac{\theta}{2}$ is the angle between $\vec{F}_1, \vec{R}$. Which of the following statements is correct

A $F_1 = 2F_2$

B $F_2 = 2F_1$

C $F_1 \times F_2 = 1$

D $F_1 = F_2$

- 9) If the force of magnitude 13 is in equilibrium with the two perpendicular forces of magnitudes: 12, F Newton are, then $F = \dots N$

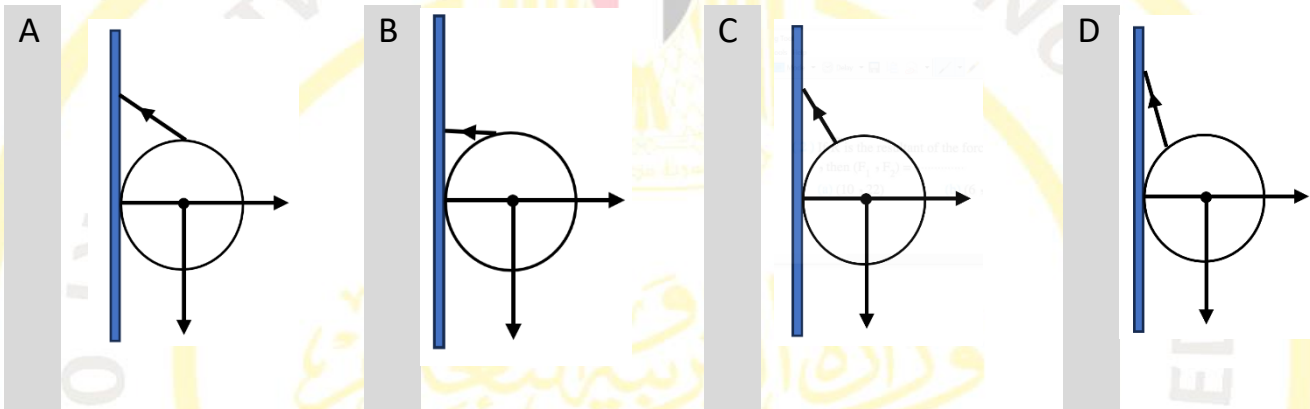
A 17

B 13

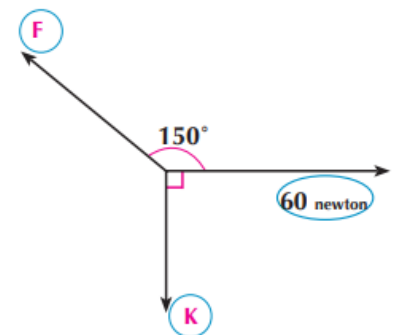
C 7

D 5

- 10) A metallic smooth uniform sphere is suspended from a point on its surface by a string and its other end is fixed at a point in a smooth vertical wall to be in equilibrium as it rests on the wall. Which of the following shapes represents the sphere in equilibrium position



- 11) In the opposite figure:
If the forces in equilibrium, then $F = \dots$ Newton



A 60

B 120

C $120\sqrt{3}$

D $40\sqrt{3}$

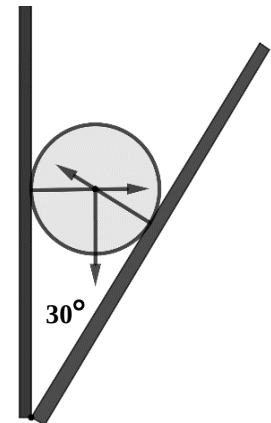
عاشور لغز الصناد



عالم لغز الفنا

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- 12) The opposite figure represents a smooth metal sphere of weight 3 Newton at rest (stable) between a smooth vertical wall and a smooth plane inclined to the vertical wall with angle of measure 30° . the pressure on the vertical wall = Newton



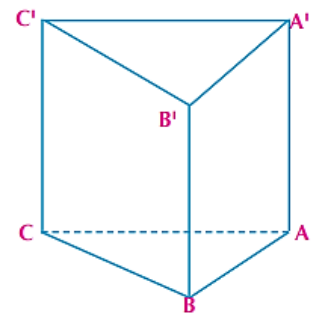
- A 3 B $3\sqrt{3}$ C 6 D $6\sqrt{6}$

- 13) Which of the following doesn't identify plane?

- A Three non-collinear points B A straight line and a point on it
C Two parallel lines D Two intersecting lines

- 14) In the opposite figure

The number of straight lines that skew with the line $\overleftrightarrow{AA'}$ is ...

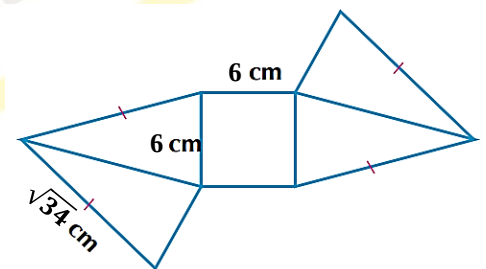


- A 0 B 2 C 3 D 4

- 15) In the regular pyramid, if a is the length of the lateral edge, b is the length of the height of the pyramid, c is the length of the slant height, then

- A $a < b < c$ B $a < c < b$ C $b < a < c$ D $b < c < a$

- 16) The opposite figure represents a regular pyramid net, then the volume of the pyramid =



- A 48 B 24 C 26 D 34



عالم الفيزياء

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- 17) The lateral area of a right cone of base radius 15 cm, and its height 20 cm.
is ... π cm²

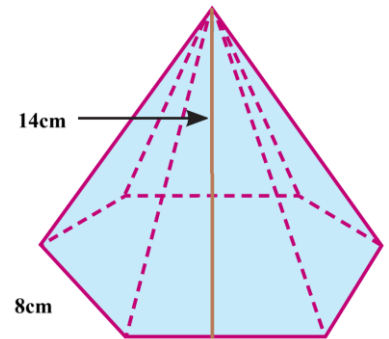
A 300

B 375

C 500

D 625

- 18) The opposite figure represents a regular hexagonal pyramid. The lengths of the base's side and the slant height are 8cm, 14cm respectively, then the pyramid's lateral area=....cm²



A 128

B 256

C 336

D 420

- 19) The equation of the circle whose diameter $\overline{AB}$ where A(2, -7), B(6, 5) is ...

A $(x - 4)^2 + (y + 1)^2 = 40$

B $x^2 + (y + 1)^2 = 40$

C $(x - 4)^2 + (y - 1)^2 = 50$

D $(x - 4)^2 + (y + 1)^2 = 50$

- 20) The radius length of the circle $x^2 + y^2 - 12x + 4y - 9 = 0$ equals ...

A 3

B 9

C 7

D 49

Second: Answer the following questions:

[1] two forces of magnitude $F, F\sqrt{2}$ Newton act at a point, their resultant is perpendicular to the first force. Find the measure of the angle between the two forces.

مختار

[2] find the general form of the equation of circle whose centre M(7, -5) and passes through the point A(3, 2).



عالم لغتنا الفصحى

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الإدارة المركزية لتطوير المناهج
مكتب مستشار الرياضيات

نموذج إجابة اختبار استرشادي نهاية الفصل الدراسي الأول
الصف الثاني الثانوي (علمي) المادة: تطبيقات الرياضيات

First: M.C.Q. questions (mark for each one)

Question number	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Correct choice	A	A	D	C	A	D	B	D	D	C	D	B	B	B
Question number	15	16	17	18	19	20								
Correct choice	D	A	B	C	A	C								

Second essay questions

Question 1 (2 marks)

$$F + F\sqrt{2}\cos \alpha = 0$$

$$\therefore \alpha = 135$$

$$\therefore \cos \alpha = -\frac{1}{\sqrt{2}}$$

Question 2 (3 marks)

$$r = \sqrt{4^2 + 7^2} = \sqrt{65}$$

$$\therefore (x - 7)^2 + (y + 5)^2 = 65$$

$$\therefore x^2 + y^2 - 14x + 10y + 9 = 0$$

هذا هو الجواب

اسئلة استرشادية للصف الثانى الثانوى
رياضيات (٢) للقسم العلمى باللغة الانجليزية

Q1

The magnitude of the maximum resultant of two forces F_1 , F_2 is 10 Newton and the magnitude of the minimum resultant of the two forces is 2 Newton. then $F_1^2 - F_2^2 = \dots\dots$, when $F_1 > F_2$

- a) 20
- b) 24
- c) 8
- d) 12

Q2

If $F_1 = 5$ Newton, $F_2 = 4$ Newton act at a point, and α is the angle between their lines of action of the two forces, $\sin \alpha = \frac{3}{5}$ then the magnitude of their resultant =....., $\alpha \in \left] 0, \frac{\pi}{2} \right[$

- a) $\sqrt{65}$
- b) $\sqrt{11}$
- c) 3
- d) $\sqrt{73}$

Q3

A regular quadrilateral pyramid, its volume 96 cm^3 , its height 8 cm,

Then its base side length =cm

a) 72

b) 36

c) 6

d) 12

Q4

A right circular cone, its base area $36 \pi \text{ cm}^2$, its height 8 cm, then its slant height =cm

a) 12

b) 10

c) 8

d) 6

Q5

$\overline{BC}$ is a uniform rod of length one meter and its weight (w) Newton is suspended from its two ends by two perpendicular strings their other end fixed at a point on the ceiling of a room , if the length of one of the two strings equals $50\sqrt{3}$ cm, find the magnitude of the tension in strings in terms of the weight of the rod (w).

Q6

Two forces are meeting a point the magnitude of their maximum resultant = 14 Newton and when the two forces are perpendicular the magnitude of their resultant = 10 Newton, then $F_1 = \dots\dots$ Newton,

$F_2 = \dots\dots\dots$ Newton

a) 6 , 8

b) 9 , 5

c) $5\sqrt{2}$, $5\sqrt{2}$

d) 5 , $5\sqrt{3}$

Q7

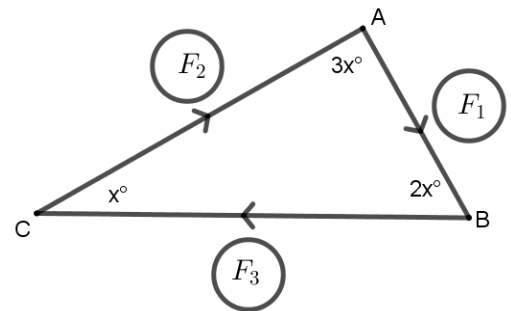
The coplanar forces of magnitudes 1, 2, $3\sqrt{3}$, 4 Newton are acting at a point where the measure of the angle between the directions of the first force and the second force is $\frac{\pi}{3}$, the second force and the third force is $\frac{\pi}{2}$ and between the third force and the fourth force is $\frac{5\pi}{6}$.

Find the magnitude and the direction of their resultant.

Q8

In the opposite figure:

ΔABC is the triangle of forces of the three equilibrium forces that act at a point.



Then $F_1 : F_2 = \dots\dots\dots$

- a) 1 : 2
- b) $1 : \sqrt{3}$
- c) 2 : 3
- d) $\sqrt{3} : 2$

Q9

Two forces of magnitude 8 and F Newton act at a point, the measure of the angle between them is 135° , if the resultant inclined with an angle of measure 45° to the force F, then:

F =..... Newton

- a) $8\sqrt{2}$
- b) 8
- c) $18\sqrt{2}$
- d) $16\sqrt{2}$

Q10

In the opposite figure:

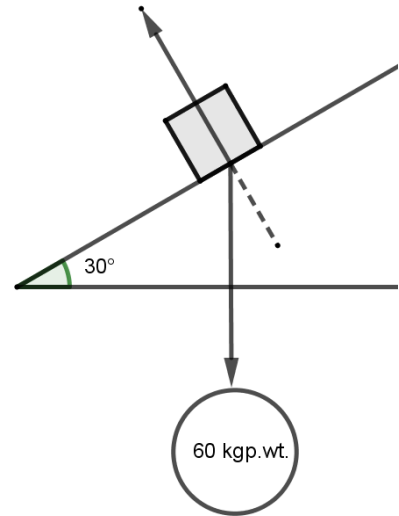
The component of the weight in the direction of the line of the greatest slope = kg wt, the component of weight in direction perpendicular to plane = kg wt.

a) $30\sqrt{3}$, 60

b) $60\sqrt{3}$, 60

c) 60 , $60\sqrt{3}$

d) 30 , $30\sqrt{3}$



Q11

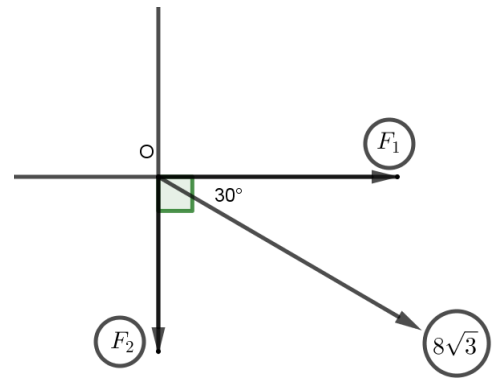
Force of magnitude $8\sqrt{3}$ Newton is resolved into two perpendicular forces F_1, F_2 , then $\frac{F_1}{F_2} = \dots$

a) $\sqrt{3}$

b) $\frac{1}{\sqrt{3}}$

c) $\frac{\sqrt{3}}{2}$

d) $\frac{1}{2}$



Q12

A regular quadrilateral pyramid, the perimeter of its base is 16 cm and whose height 9 cm is put inside a container in the shape of a right circular cylinder, contains water. If the level of water raises $\frac{21}{88}$ cm, Find the radius length of the base of the cylinder given that $(\pi \simeq \frac{22}{7})$.

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9

